

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 3 05736WO/PRS	FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. PCT/IB2004/002181	International filing date (day/month/year) 30-06-2004	Priority date (day/month/year) 23-12-2003
International Patent Classification (IPC) or national classification and IPC See Supplemental Box		
Applicant Nokia Corporation et al		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 6 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
 - a. ☒ (sent to the applicant and to the International Bureau) a total of 2 sheets, as follows:
 - ☒ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
 - ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
 - b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

<input checked="" type="checkbox"/> Box No. I	Basis of the report
<input type="checkbox"/> Box No. II	Priority
<input type="checkbox"/> Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
<input type="checkbox"/> Box No. IV	Lack of unity of invention
<input checked="" type="checkbox"/> Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
<input type="checkbox"/> Box No. VI	Certain documents cited
<input type="checkbox"/> Box No. VII	Certain defects in the international application
<input type="checkbox"/> Box No. VIII	Certain observations on the international application

Date of submission of the demand 17-10-2005	Date of completion of this report 28-02-2006
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Form PCT/IPEA/409 (cover sheet) (April 2005)

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/IB2004/002181

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of: **Cover sheet**

INTERNATIONAL PATENT CLASSIFICATION (IPC) :

H04M 1/02 (2006.01)

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/IB2004/002181

Box No. I **Basis of the report**

1. With regard to the language, this report is based on:

- ☒ the international application in the language in which it was filed
- ☐ a translation of the international application into _____, which is the language of a translation furnished for the purposes of:
- ☐ international search (Rules 12.3(a) and 23.1(b))
- ☐ publication of the international application (Rule 12.4(a))
- ☐ international preliminary examination (Rules 55.2(a) and/or 55.3(a))

2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

- ☐ the international application as originally filed/furnished
- ☒ the description:
- pages 1 - 3, 5 - 16 as originally filed/furnished
- pages* 4 received by this Authority on 12-01-2006
- pages* _____ received by this Authority on _____
- ☒ the claims:
- pages 17 - 19 as originally filed/furnished
- pages* _____ as amended (together with any statement) under Article 19
- pages* 20 received by this Authority on 12-01-2006
- pages* _____ received by this Authority on _____
- ☒ the drawings:
- pages 1 - 18 as originally filed/furnished
- pages* _____ received by this Authority on _____
- pages* _____ received by this Authority on _____
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to the sequence listing (*specify*): _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to the sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/IB2004/002181

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	<u>1 - 28</u>	YES
	Claims		NO
Inventive step (IS)	Claims		YES
	Claims	<u>1 - 28</u>	NO
Industrial applicability (IA)	Claims	<u>1 - 28</u>	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

The purpose of the invention is to improve a foldable handheld electronic device.

The following documents were cited in the International Search Report:

D1: EP 1335567 A1
D2: US 20030210440 A1
D3: US 6549789 B1
D4: US 6650547 B2
D5: US 20020044425 A1
D6: US 20030036365 A1

Document D1 (column 2, line 34 - column 7, line 59, figures 1 - 4, abstract) discloses a mobile terminal casing formed of two bodies (2, 3) pivotally connected by a double axis (6, 7) hinge joint. One of the bodies (2, 3) has a display (11) and the other has a keypad (8).

Document D2 (chapters 0048 - 0050, 0055 and 0212, figures 1, 6 - 7) discloses a personal digital assistant (PDA) or a portable telephone (chapter 0212) having a display (11) mounted for pivotal opening and closing motion around a first axis (12-1) of a hinge (12) with respect to a body (13). The display (11) is mounted for further pivotal motion around a second axis (11-6) substantially perpendicular to the first axis (12-1). A camera (22) is disposed for turning motion at a position of the hinge (12).

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Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of: BOX V

Document D3 (column 4, line 33 - column 6, line 11, figures 2 - 11, abstract) discloses a handheld electronic device, such as a cellular radiotelephone, having a housing formed of two housing portions (202, 204) pivotally connected by a swivel hinge (214) that allows the two housing portions to rotate about a first axis (302) and a second axis (304) perpendicular to the first axis (302).

Document D4 (column 1, line 1 - column 6, line 56, figures 1 - 9, abstract) discloses a portable cellular phone, having a manipulation module (1) and a display module (2) that are rotatably mounted about two axes (9a, 9b) which are orthogonal to each other by way of a support body (10).

Document D5 (chapters 0001 - 0050, figures 1 - 7, abstract) discloses a foldable portable communication device having a hinge (36) and camera arm (18) that is rotatable about an axis that is orthogonal to the axis (C) of the hinge (36).

Document D6 (chapter 0005, figures 1 - 3) discloses a foldable portable mobile phone having a hinge (76) and a camera (77) that is rotatable about an axis that is orthogonal to the axis of the hinge (76).

The invention claimed in claims 1, 18 - 20 and 27 differs from what is known from document D1, the closest prior art, essentially in that one of the bodies is connected for rotation around a third axis which is perpendicular to the double axis.

The technical problem is how to improve the mobile terminal.

However, a similar technique is known in the same technical field from each of documents D2, D3 or D4 (below). It would be obvious to a person skilled in the art to use this technique in the mobile terminal of document D1, especially considering no unexpected technical effect is obtained. Therefore, the invention claimed in claims 1, 18 - 20 and 27 is novel but lacks an inventive step. The invention claimed in claims 1, 18 - 20 and 27 fulfils the requirement of industrial applicability.

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Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of: BOX V

Document D2 (chapters 0048 - 0050, 0055 and 0212, figures 1, 6 - 7) discloses a handheld electronic device (personal digital assistant, PDA, or portable telephone, see chapter 0212) having a hinge (12), a first rotatable body member (13) with a keypad (34), and a second rotatable body member (11) with a view screen (28). The second rotatable body member (11) is rotatable around two perpendicular axes (11-6, 12-1) relative the first rotatable body member (13). A camera (22) is disposed for turning motion around a first axis (12-1) relative the first rotatable body member (13).

The invention claimed in claim 28 differs from what is known from document D2, the closest prior art, essentially in that the camera (third rotatable body member) is rotatable relative the first rotatable body member around a second axis that is perpendicular to the first axis.

The technical problem is how to increase the possible directions for directing the camera.

However, it is common general knowledge to direct a camera by the use of pivoting means for turning the camera around two perpendicular axes.

Considering no unexpected technical effect is obtained, it would be obvious to a person skilled in the art to use this knowledge to modify the device of document D2, thereby arriving at a device having all the essential features of claim 28. Therefore, the invention claimed in claim 28 is novel but lacks an inventive step. The invention claimed in claim 28 fulfils the requirement of industrial applicability.

In claims 2 - 17 and 21 - 26 slight constructional variations are suggested that are obvious to a person skilled in the art, especially considering what is known from documents D1 - D6 and well known from similar art. Therefore, the invention claimed in claims 2 - 17 and 21 - 26 is novel but lacks an inventive step. The invention claimed in claims 2 - 17 and 21 - 26 fulfils the requirement of industrial applicability.

To sum up, the invention claimed in claims 1 - 28 is novel but lacks an inventive step. The invention claimed in claims 1 - 28 fulfils the requirement of industrial applicability.

IAP2 Rec'd PCT/PTO 22 JUN 2006

Summary of the Invention

An aim of the embodiments described hereinafter is to solve the problems outlined above.

According to the present invention there is provided a handheld electronic device hinge for mechanically connecting first and second rotatable body members of a handheld electronic device, said hinge comprising a first bracket and a second bracket, wherein said first bracket comprises: a first connecting member for connecting to the first rotatable body member of the handheld electronic device for rotation around a first axis; and a second connecting member connected to the second bracket for rotation of said second bracket around a second axis, said first and second axes being parallel to each other, and wherein said second bracket comprises a third connecting member for connecting to the second rotatable body member of the handheld electronic device for rotation around a third axis, said third axis being perpendicular to said first and second axes.

According to another aspect of the present invention there is provided a handheld electronic device comprising a first rotatable body member, a second rotatable body member and a handheld electronic device hinge as described herein, said handheld electronic device hinge connecting said first rotatable body member and said second rotatable body member.

According to another aspect of the present invention there is provided a handheld electronic device comprising a first rotatable body member, a second rotatable body member, a third rotatable body member and a handheld electronic device hinge, said handheld electronic device hinge being disposed between said first, second and third rotatable body members whereby said first, second and third rotatable body members are rotatable relative to each other wherein said first rotatable body member comprises a keypad, said second rotatable body member comprises a view screen and said third rotatable body member comprises a camera wherein said second rotatable body member is rotatable around two perpendicular axes relative to said first rotatable body member, and wherein said third rotatable body member is rotatable around two perpendicular axes relative to said first rotatable body member.

Embodiments of the present invention have solved the above-identified problems by providing a handheld electronic device comprising two portions with a hinge mechanism therebetween. The hinge mechanism functions such that the two portions can be articulated into a plurality of different relative configurations.

23. A handheld electronic device according to claim 21 or claim 22, wherein said third body member is detachably connected to said hinge.
24. A handheld electronic device according to any one of claims 18 to 23, wherein said handheld electronic device further comprises a connecting element for connecting the mobile phone to a stand.
25. A handheld electronic device according to any one of claims 18 to 24, wherein said handheld electronic device further comprises a connecting element for connecting the mobile phone to an armband.
26. A handheld electronic device according to any one of claims 18 to 25, wherein said handheld electronic device further comprises a connecting element for connecting the mobile phone to a necklace.
27. A handheld electronic device according to any one of claims 18 to 26, wherein the electronic device is at least one of a mobile gaming device, a mobile phone, a hand-held video recorder, an electronic note pad, an electronic book, a PDA, a calculator, a personal stereo and a dictaphone.
28. A handheld electronic device comprising a first rotatable body member, a second rotatable body member, a third rotatable body member and a handheld electronic device hinge, said handheld electronic device hinge being disposed between said first, second and third rotatable body members whereby said first, second and third rotatable body members are rotatable relative to each other wherein said first rotatable body member comprises a keypad, said second rotatable body member comprises a view screen and said third rotatable body member comprises a camera wherein said second rotatable body member is rotatable around two perpendicular axes relative to said first rotatable body member, and wherein said third rotatable body member is rotatable around two perpendicular axes relative to said first rotatable body member.